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Turmoil in Malaria R&D Program Spurs Congressional Inquiry

A Congressionally ordered investigation into a long-running government program to develop a malaria vaccine was quietly initiated last week following a bizarre series of events that have spread turmoil among researchers in the program.

Behind the inquiry is concern for survival of a nationwide network of collaborative research groups that have achieved important scientific advances against malaria. The disease arouses little public or political interest in the US, where it has been eradicated, though only as recently as 1951. But worldwide, malaria is estimated to kill five million persons a year and infect at least 300 million. In some regions, the disease is on the upswing as resistances develop to the commonly used anti-malarial drugs and insecticides.

The inquiry is being conducted by the General Accounting Office (GAO), the investigative arm of Congress, at the request of Senator Daniel K. Inouye (D-Hawaii), Chairman of the Foreign Operations Appropriations Subcommittee, which has jurisdiction over the principal sponsor of the research program, the Agency for International Development (AID). Associated with

"You're a Lunatic," Secretary Shultz Told Science Adviser Keyworth—P. 6

the malaria program are the Centers for Disease Control, the US Army, and the National Institutes of Health, and directly involved as AID contractors is a network of about a dozen university-based research groups and private research institutes.

The investigation has been undertaken without public announcement or willingness of many key participants to talk for the record. But on the basis of information and documents obtained by SGR, the GAO investigators face a swampland of intrigue. It includes:

- A slanderous campaign against the AID official who is widely credited for the successes of the research network, James M. Erickson. The campaign culminated in his abrupt assignment 15 months ago to administrative leave at full pay, following flimsy and still-unresolved charges of "sexual harrassment." Up to the time of Erickson's ouster, he was repeatedly rated outstanding by his government superiors, given cash merit awards, and widely hailed as AID's internal champion and orchestrator of the malaria research network.
- Suddenly announced reductions, averaging 40 percent, in AID's previously stated plans for supporting malaria research in the research groups in the malaria network. The cutbacks are occurring at a time when the

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Britain: Thatcher's Prescription For R&D Hits the Universities

London. Numerous diagnoses of Britain's industrial anemia invariably agree that industry has failed to capitalize on the strength of academic research organizations. The post-war record is strewn with missed opportunities for extracting wealth from homegrown scientific advances. These range from carbon fibers to monoclonal antibodies, from software to nuclear fission. Now the Thatcher government, returned to office for a historic third term, is putting into place its own ideas for remedying the painful paradox of strong science and weak industry.

The proposed medicine is far stronger than current science-policy tinkerings in the US for deriving more commercial payoff from academic science. But, given the growing financial strains on science in America, the British experience may turn out to be a precursor of events to come.

The blame for Britain's science-industry plight, ac-

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In Brief

Budget constrictions on Capitol Hill continue to plague NSF's hopes for rapid growth. After cutting the requested increase for next year from $333 million to $168 million (SGR June 1), the House Appropriations Committee may have to take a further whack to stay within the bounds of the FY 1989 budget resolution. NSF's Appropriations Subcommittee has to shed some $450 million from the $60 billion that it has allocated to agencies in its jurisdiction. Meanwhile, its Senate counterpart, chaired by the frugal William Proxmire (D-Wisc.), starts out with about $1 billion less than the House for all those agencies.

Academic R&D spending has abruptly come down from the rapid growth pace of recent years. The latest figures show a real growth rate of only two percent from 1986 to 1987, NSF reports, compared to nine-percent average annual growth from 1984-86. The decline is mainly attributed to a slower pace of spending by federal agencies.

The spending slowdown helps rigidify the standings of academic institutions in receipt of federal R&D funds. The top 20 universities took in 40 percent of the total in 1986, and the top 100 got 85 percent. NSF notes that these are "similar to shares reported during the past decade." Not noted is that the list itself has changed little in two decades. (These and other data are in NSF *Highlights* No. 88-314, 6 pp., no charge; from: NSF, Division of Science Resources Studies, 1800 G St. NW, Washington, DC 20550; tel. 202/634-4634.

. . . Malaria Research and the Puzzling Colombia Links

(Continued from page 1)

vaccine-development program is grappling with technical snags that have put it perhaps two years behind schedule. The overall budget, $10 million in fiscal 1987, was cut to $8.5 million this year, and may be further reduced next year.

- The unexplained deposit of US government research funds into a numbered Swiss bank account by a Bogota, Colombia, research institute that at one time was in the research network. The checks, 40 in all, drawn between 1982 and 1984, total $144,987. According to some sources, these checks, copies of which have been obtained by SGR, are a small portion of AID research funds that followed the same route.
- A high-level inquiry about the possibility of using the anti-malaria program in Colombia as a cover for spraying cocaine-growing areas with Agent Orange.
- A lengthy Justice Department investigation of a participating research group at the University of Illinois—suspected and apparently cleared of illegally selling laboratory monkeys purchased with AID funds.
- The sore issue of AID's sudden decision to sell some 1300 laboratory monkeys, acquired at a cost of about $500,000 since 1985, from a specially established Pan American Health Organization center in Peru. The center was created with AID's assistance to avoid dependence on blackmarket sources. The monkeys are currently running up room-and-board bills of $5000 a day while AID battles the paperwork involved in disposing of government property. Researchers in the malaria network insist that they need the monkeys, but AID officials are determined to go through with a sale.

At the center of the controversy is the AID official on prolonged, enforced administrative leave, James M. Erickson, age 41, who, since April 1987, has been drawing take-home pay of $3434.90 a month for doing nothing. Erickson, who holds a PhD in ecology, joined the AID malaria vaccine program in 1979 and headed it from 1982 until he was pushed out on leave last year.

The leave was decreed by AID following charges of sexual harrassment brought by the American Institute for Biological Sciences. AIBS, a Washington-based consortium of research societies, has served since 1982 as AID's contractor for administering the malaria research program, and currently holds an $8.7-million, five-year contract.

Erickson has countered that AIBS was wasteful and laggard in carrying out its duties and that it retaliated with the harrassment charges when he demanded improved performance. AIBS officials and employes have charged, in statements to an investigator hired by AID, that Erickson bore down unfairly on their organization because of a failed love affair with an employe there. He acknowledges the affair, but insists it had nothing to do with his contention that AIBS was failing in its role of performing administrative housekeeping for the research network. Many members of the research network support Erickson's criticism of AIBS's performance, alleging inadequate preparations for meetings, sloppiness in paperwork, and general confusion in running a complex, nationwide research program with many foreign affiliations.

Erickson's administrative leave, originally set for up to 120 days, has since been twice extended without disposition or explanation of the charges. The investigator hired by the AID Inspector General took depositions from staff members at AID and AIBS, and produced three volumes of transcripts and associated documents, without analysis or conclusion. Erickson has filed a law suit against AID, seeking disposition of the charges. The case is scheduled for a hearing August 18 in Federal District Court, Alexandria, Va. Meanwhile, the AID malaria program is headed on an acting basis by a physician and public health planner, James Heiby, who volunteers that he's not an expert in malaria research.

The Colombia connection has spawned a slew of charges and countercharges, at least one law suit, and intriguing speculations. By Erickson's account, he inherited a small but scientifically unproductive AID-supported project in Colombia when he took over the malaria-research network in 1982. Conducted by the Colombian National Institute of Health in Bogota, the project received $650,000 a year from AID, and AIBS got an additional 30 percent for monitoring its work.

Erickson, who traveled widely and often in the course of his duties, reports that when he wanted to visit the Bogota project, he was repeatedly thwarted by higher-ups on grounds of lack of funds, which he found difficult to accept, given his routine travels elsewhere. Finally permitted to visit Bogota, he says he was directed to meet on arrival with Ambassador Lewis Tambs for what Erickson says was termed a "private talk." Attending,

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. . . Says Ambassador Sought Cover for Cocaine Spraying

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he says, were two individuals who were not introduced to him.

Erickson says that Tambs asked him to develop a malaria-control program for Colombia "that he could use as a cover for the Agent Orange spraying he wanted to do in the cocaine growing areas of the country."

Erickson says he told the Ambassador that "the cover would never work since in the 40 years of worldwide anti-malaria-eradication efforts, the use of airplanes, especially ex-Viet Nam spray bombers, had never been useful in suppressing the mosquito populations" that cause the disease. "Ambassador Tambs," Erickson says, "was somewhat irritated with me and I was rather quickly sent home without ever getting to see what malaria vaccine research was going on in Bogota and not seeing the malaria areas of the country at all." Tambs has since been implicated in the diversion of funds in the Iran-Contra affair.

Erickson says he intended to let the Bogota research contract expire without renewal, on the grounds that it wasn't productive. But in 1985, he told SGR, he was directed to go to Bogota "as soon as possible and personally pick up a new research proposal" from that country's National Institute of Health. When he got there, Erickson says, he found the Colombians had not prepared a proposal. They were expecting him to write it for them. He says he cooperated to the extent of outlining a possible project, but returned empty-handed to Washington to explain to his "furious" superiors that "I could not write a proposal for someone else and then review it and manage it too."

Last year, as Erickson's troubles mounted at AID, the unexplained check deposits to a numbered account in Zurich came into the picture. The checks were written by AIBS—the AID contractor that parcels out AID funds for the malaria vaccine program—and were made out to "Malaria Immunology Unit," a part of the Colombian National Institute of Health.

In an interview with SGR, Charles M. Chambers, the Executive Director of AIBS, refused to comment on the checks, beyond acknowledging that "the matter has been reviewed" by the AIBS Board, "and we are satisfied that we are fulfilling our responsibilities." He also declined to comment on a lawsuit brought by a Colombian researcher who says AIBS owes him money for his role in the malaria project. Nor would Chambers comment on Erickson's charge that AIBS illegally taped his phone calls.

Chambers also refused to discuss the Justice Department's lengthy investigation of the University of Illinois' participation in the vaccine project. The project there, headed by Professor Miodrag Ristic, of the College of Veterinary Medicine, Urbana-Champaign, employs about 20 researchers and technicians. Last year, according to a letter from R. E. Dierks, Dean of the School, to Senator Paul Simon (D-Ill.), "it was learned that employes of AIBS had spread malicious stories about Dr. Ristic selling primates for personal profit and that AIBS would never send a primate to Illinois. Given the fact that our research team has been waiting six months for the release of primates from Florida to Illinois to test malarial antigens . . . it becomes difficult to understand how AID can continue to support the continuation of AIBS as an organization to provide services to the malaria program."

Senator Simon says that Dean Dierks subsequently notified him that he "had received a letter from the Department of Justice asking for detailed financial information about Dr. Ristic." The letter, according to an inquiry that Simon sent to the Justice Department last October, "informed the Dean that this was part of a grand jury investigation. While some of the information

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The Malaria Vaccine Network

Inaugurated in 1966 as a still-rare venture by AID into biomedical research, the Malaria Immunity and Vaccine Research Program has been operated through what's termed the Network—a collection of academic and independent non-profit research organizations that has varied in number over the years in response to research opportunities and funds. Following are the home institutions and the principal investigator of each project currently in the Network.

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New York University Medical Center, site of the Network's largest research group, Ruth Nussenzweig; Rockefeller University is a subcontractor on the NYU project.

University of Hawaii, Wassim Siddiqui.

Agouron Institute (La Jolla, Calif.), Robert Reese and team, formerly located at Scripps.

University of Illinois, Urbana, Miodrag Ristic.

Biomedical Research Institute, Rockville, Md., Michael Hollingdale, Werner Zolg.

Centers for Disease Control, Carlos P. Campbell.

Case Western Reserve University, Masamichi Aikawa.

Pan American Health Organization, Primo Arambulo.

Battelle Pacific Northwest Laboratories, Richard Weller, Charles Watson.

University of Maryland, Center for Vaccine Development, Myron Levine.

University of Southern California, John Martin.

Institute of Medical Research, Papua New Guinea, Michael Alpers.

. . . Squeezing Academe to Seek Support from Industry

(Continued from page 1)

cording to the consensus of the past decade, is shared by the country's academic and business leaders, most of whom have been indifferent to the cross-linkages that have proven so profitable in other nations, particularly the United States.

In response, Mrs. Thatcher and her advisers have concluded that the correct course is to squeeze the science base of the universities so that financially hard-pressed academics will be inclined to seek industrial ties to make up for lost funding. Since the payer calls the tune, the quest for financial relief would inevitably bring academic science closer to industrial requirements—at least according to the Thatcherite strategy. Rounding it out is recognition of the need to educate industry about the scientific and technical skills waiting to be tapped in academe.

Three key parts of the strategy have so far been put into place. Sir David Phillips, Chairman of the UK's Advisory Board for the Research Councils, last year produced a far-ranging, and strongly disputed, proposal for revamping the support of research, *A Strategy for the Science Base* (49 pp., £3.95 [about $7.25], available from: HMSO Publications Center, PO Box 276, London SW8 5DT, England; tel. 01/622-3316).

- Proceeding from the premise that a firm lid would have to be put on research spending, the document proposes the stratification of higher-education institutions based on their capacity for performing first-class research. A major goal would be to concentrate resources in laboratories with outstanding records of achievement. Another would be to give preference to those that have a successful track record in addressing industrial problems. "Emphasis should be given," the report frankly states, "to the potential for producing useful results—exploitability."

- A second key initiative was ushered in at about the same time—the establishment of University Research Centers, supported by large chunks of government money to set up multi-disciplinary teams focused on industrial problems. Four centers have been established so far: at Cambridge University, for superconductivity research; Glasgow University, engineering design; Liverpool University, surface sciences, and Oxford University, molecular sciences. In each case, the centers are expected to collaborate with industrial firms, raising revenues from the private sector to match funds provided by the government.

- The final link in the strategy for industrial rejuvenation via science is the newly established Center for Exploitable Science and Technology (CEST)—an untried think-tank operation that is the object of much hope and many doubts. The center is backed by about $11 million spread over the next five years, with $1.8 million provided by the government and the balance from about 20 of Britain's biggest high-tech industrial firms, including Pilkington, Rolls-Royce, British Telecom, and British Aerospace.

CEST is being set up in the science park at Manchester University, with a fulltime staff of 10-20. Its most important assignment is to direct more of the government's overall R&D funding toward areas that can be commercially exploited. But many difficulties lie in the path of that goal. Total government research funding comes to about $8.3 billion a year, of which half is defense related and stoutly defended by the defense lobbies. CEST plans to sponsor studies to identify possible links between government-supported research, both civilian and military, and industrial opportunities.

In connection with this, CEST plans to monitor relevant R&D practices in other nations, especially the US and Japan. The organization is headed by Bob Whelan, a former technology consultant who is little known in industry or academe. Several of the leading academic science-policy figures in Britain decided against apply-

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Malaria Inquiry

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requested involved Dr. Ristic's AID grant, some involved financial information unrelated to his government-related work." Simon asked the Justice Department for an explanation, but 10 months later, has not had a reply. In the meantime, Ristic has been notified that his contract will be extended, but at a reduced level.

The GAO inquiry got underway last week with two investigators meeting with a staff assistant of Senator Inouye and later with a malaria expert familiar with the vaccine program. The GAO is expected to coordinate its investigation with inquiries that have been conducted by the AID Inspector General (IG), which is an old hand at dealing with hollow charges against James M. Erickson. In 1986, the IG looked into four charges against Erickson from "anonymous" informants. These involved accusations of favoritism in a hiring for a minor, temporary job; use of AID funds for personal travel; personal use of a government-owned TV set; and a monkey research trip to "an island in Hawaii which doesn't have monkeys." In addition, his superior, Kenneth Bart, who is on leave to AID from the Centers for Disease Control, accused Erickson of doctoring an official report.

The Inspector General concluded: "No testimonial or documentary evidence was obtained to substantiate the aforementioned allegations."—DSG

. . . Support and Opposition for Industrial R&D Program

(Continued from page 4)

ing for the post because of their uncertainties about the aims of the center.

Still in the embryonic stage, CEST has already come under attack by GEC, Britain's biggest electronics and electrical firm, which has pointedly refrained from joining the consortium. The reason, according to Derek Roberts, a semiconductor engineer who is GEC's Joint Deputy Managing Director, is that the firm feels that CEST is aimed at usurping industry in deciding on research relevant to industrial needs; that task, Roberts insists, is best left to individual companies.

He adds that the main problem of science in Britain is a shortage of resources in the universities, a problem, he contends, that only the government can remedy. Roberts charges that CEST's aims are unclear and that "there was a strong element of blackmail" behind the decisions of the 20 companies to support it: "They joined up because Mrs. Thatcher told them it was a good thing for them to do," he claims.

The issue of cash for the universities has been under constant debate, with the government coming under fire in particular from academics who have argued vociferously that the level of support is inadequate to keep Britain on the frontiers of science. The government responded that the sums earmarked for science, now running at about $1.3 billion a year, should not be exempt from efforts to constrain public spending. While the government insists that the financially induced reshaping of research will benefit the nation, mainstream academics are complaining that the support for the University Research Centers is diverting scarce cash from established, important areas of research. In these laments, they sound not at all different from American counterparts who look with fear on the National Science Foundation's expanding network of university-based research centers.

The anxious academics have found support in other quarters, most notably in the Science and Technology Committee of the House of Lords. Though generally regarded as a fossilized body, the Lords have lately been performing as a nettlesome opposition to the Thatcher majority in the House of Commons. In tightly argued reports, the Committee has strongly criticized the government's stance on levels of spending for space and medical research. Lord Shackleton, who chairs the Committee, said that there was "an absolute need" for greater government support of basic science in the universities.

Worryingly for a government that prides itself on close rapport with business, the new science strategy has also come under attack from the UK pharmaceutical industry. One of the country's few successful science-based businesses, pharmaceuticals are experiencing strong sales growth and an annual export-to-import surplus of some $1.5 billion. The industry is spending some $1.3 billion this year on research, mostly its own money, in contrast to the heavy reliance of other industries on government support of their research. Rather than take on the uncertain role of promoting commercialization of R&D, the pharmaceutical industry argues, government should enhance the underlying scientific base by increasing support for the straitened departments of biology, chemistry, and medicine in the nation's universities.

Much of the debate on science strategy centers on the Medical Research Council (MRC), one of five discipline-oriented councils that dispense government research funds to the academic sector. The MRC has a current budget of $250 million. Its staff says it needs another $72 million to do the job properly. The pharmaceutical industry agrees that more is needed. John Griffin, Director of the British Pharmaceutical Industry, says the pharmaceutical industry relies on a stream of ideas and people from university science departments. He says he fears a brain drain of talented medical researchers unless the situation is improved. Richard Sykes, research head at Glaxo, Britain's biggest pharmaceutical company, says government support of university science should be expanded rather than contracted.

While these plans are jelling and being fought over, there has been a stream of reports warning that the outlook for much of high-tech industry here, apart from the success stories of pharmaceuticals and chemicals, is by no means improving under the Thatcher regime. According to the Science Policy Research Unit at Sussex University, West Germany increased its lead in technological performance in 31 out of 33 business sectors between 1963-68 and 1981-86, far ahead of Britain's performance.

Another recent report, from PA, a respected management-consulting group, concluded that British industry was guilty to an "alarming" degree of not doing sufficient R&D directed at high-value products. The effect of shortchanging R&D has shown up in the last five years, according to the PA study, which warned that engineering, electronics, and materials face the prospect of falling still further behind in international competitiveness.

Despite these protests, the basic new strategy remains unchanged: squeeze academic science into closer ties with industry.—Peter Marsh

The author is technology correspondent of the London *Financial Times*.

Insider Accounts Tell of Keyworth Hiring, SDI Role

As implausible as it seems, the Washington policies and policymakers that roil the scientific community rarely reach the threshold of notice in the memoirs of White House political insiders or journalistic spectators of Washington politics. For example, former White House Chief of Staff Donald Regan's For the Record, *celebrated for its astrological revelations, contains no mention of White House Science Adviser George (Jay) Keyworth II. However, two other recently published works provide provocative exceptions to this neglect. Excerpts from these works follow:*

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From* Revolution *(486 pp., $19.95, Harcourt Brace Jovanovich), by Martin Anderson, former White House chief domestic and economic policy adviser.

During the untidy first months of the new administration, the responsibility of finding a good science adviser fell to the Office of Policy Development . . . During my years on Nixon's White House staff in the late 1960s I watched the role of science adviser move away from being a representative of the president to the scientific community and a provider of the best scientific advice available, to being the representative of the scientific community as just one more powerful special interest group, whose eyes were fixed on the growing pots of money in Washington. I strongly urged that we return to the concept of science adviser that worked so well for Jack Kennedy when he was president, that we do away with the formal Office of Science and Technology Policy, cut the staff drastically, and find an eminent scientist who liked the idea of being the science adviser to the president, not the envoy of the scientific community to the president.

Keyworth fit those specifications precisely and, as a bonus, he came from a weapons laboratory [Los Alamos] and was not hostile to using science to help defend the country. But when the scientists of America found out what we were up to they were furious, apparently indignant that anyone could be so presumptuous as to select a scientist who was not first blessed by the reigning mandarins of science. For weeks they mounted an increasingly virulent campaign of abuse and vilification against Keyworth. The anti-Keyworth letters poured in . . . .

I recall saying that "when this is over and Keyworth is the science adviser, those scientists will fall all over themselves praising his virtues" . . . and, sure enough, within months the scientific community made peace and began to praise him . . . .

[In February 1983], the Joint Chiefs met with President Reagan and recommended [moving] ahead with the research and development of a missile defense system . . . . Reagan knew it was time to go, politically . . . . His deputy national security adviser, Robert McFarlane, although a relative newcomer to the Reagan inner circle, knew exactly what his commander-in-chief wanted done. So, early in March 1983, McFarlane, using the ultimate means of secrecy, his own typewriter, sat down and composed a draft of the strategic missile defense statement, which was later shared with and edited by Dr. Keyworth.

[Anderson does not identify sources for this account.]

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From* The Power Game: How Washington Works *(793 pp., $22.50, Random House), by Hedrick Smith, who served many years with the* New York Times *in Washington.

Coincidentally, the day before McFarlane called Keyworth [to discuss missile defense], the White House Science Council had finished a meeting. Keyworth had routinely asked that group whether any technologies, offensive or defensive, held military promise over the next five years, and one participant told me the group had given a categorical no. But Keyworth himself and a smaller panel had seen long-term potential for defenses in one experiment that had bounced directed-energy beams off mirrors in space. So Keyworth told McFarlane he favored increased research on defense.

With that, McFarlane handed him the SDI bombshell and asked for help. As Keyworth read it, he was numb at the dramatic shift Reagan was going to propose . . . .

"Bud," he said, "there are so many considerations we have not thought through here. They go from technical feasibility to implications for the Atlantic Alliance, to implications for arms control, to what the Soviets are doing in those areas, to what the reactions will be in the scientific community" . . . .

But McFarlane drew Keyworth into his game. They had a heart-to-heart talk, McFarlane asking Keyworth what problems he saw, how he would change the draft. Within half an hour, Keyworth said, he was enlisted in the cause . . . .

About 24 hours before Reagan's scheduled speech [March 1983, announcing SDI], Richard DeLauer, the Pentagon's top-ranking scientist with the title of Defense Under Secretary for Research and Engineering, saw Reagan's speech and exploded in disbelief at Reagan's grandiose dream.

"That's nonsense," DeLauer told Keyworth. "That can't be so."

DeLauer concluded that Reagan and other top policy advisers [including Defense Secretary Weinberger] did not understand what they were proposing . . . .

Drafts of Reagan's speech caused . . . shock waves among the Pentagon's top civilian hierarchy . . . . [Richard] Perle [Assistant Secretary of Defense for International Security Policy] was stunned . . . . With Weinberger's approval, Perle said, he tried to delay the

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In Print: Decade of R&D Job Growth Chronicled in NSF Study

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Doctoral Scientists and Engineers: A Decade of Change (114 pp., NSF 88-302, no charge), a special NSF report that provides a statistical portrait of the phenomenol growth that has occurred in these professions in recent years. A few items: Between 1975-85, employment of doctoral scientists and engineers rose from 256,100 to 400,000, an annual growth rate of 4.6 percent, compared to 2 percent for the rest of the economy. The most rapid annual rate of growth was in the industrial sector, 6.9 percent, compared to 3.6 percent for academic employment.

Median salaries for PhD scientists and engineers outpaced the rest of the non-agricultural economy, but did not keep up with the Consumer Price Index during the 1975-85 period. The PhDs' earnings rose by 93 percent, while the CPI went up 100 percent.

The employment of women PhDs rose from 22,000 to 58,000, an annual growth rate of 10 percent, compared to about 4 percent for men. PhDs from "racial and minority groups" increased from 16,500 to 41,000 during the decade; 85 percent of the growth, NSF reports, "is attributed to Asians, whose numbers rose from 14,000 to 35,000. In 1985," the report continues, "Asians accounted for 8.6 percent of all employed doctoral scientists and engineers, up from 5.3 percent in 1975. During the same period, the number of black doctoral scientists and engineers rose from 2500 (or 1 percent of all employed S/E doctorates) to 5700 (1.4 percent). The number of native Americans rose from about 200 to 500 between 1975 and 1985."

Available from: NSF, Division of Science Resources Studies, 1800 G St. NW, Washington, DC 20550; tel. 202/634-4634.

Job Changes and Appointments

Arnold S. Relman, Editor of the *New England Journal of Medicine* since 1977, will become Editor-in-Chief July 1. ***Marcia Angell,*** currently Senior Deputy Editor, will become Editor, with responsibility for day-to-day operations.

Charles R. Cantor, Chairman of Genetics and Development at Columbia University, has been appointed Director of the Human Genome Center at the Lawrence Berkeley Laboratory.

William H. Jaco has been appointed Executive Director of the American Mathematical Society, succeeding ***William J. LeVeque,*** who has retired. Jaco became Head of the Department of Mathematics at Oklahoma State University in 1982, and has recently been on leave at the University of Melbourne.

Philip L. Johnson has been appointed Executive Director of the newly established Washington office of the President's Arctic Science Research Commission (Interstate Commerce Commission Building, Suite 6333, 12th St. and Constitution Ave. NW, Washington, DC 20424; tel. 202/371-9631). Johnson formerly served with NSF and as President of the John Gray Foundation.

Roland Schmitt, the former GE research executive who became President of Rensselaer Polytechnic Institute last year, has been reappointed to the National Science Board, the 24-member policymaking body for NSF. Schmitt stepped down as Chairman and member in May when his term expired. He has been succeeded as Chairman by ***Mary L. Good,*** of Allied-Signal Corp. Also appointed to the Board: ***Charles L. Hosler Jr.,*** Vice President for Research and Dean of the Graduate School, Penn State.

Washington

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speech. He put in a transatlantic call to urge Jay Keyworth "to fall on your sword" to block Reagan from making the speech, according to one White House source. Perle wanted Keyworth to threaten to leak Reagan's plan to the press in order to kill it, if he could not stop the speech by direct appeal. Keyworth refused . . . .

At one White House meeting, [Secretary of State] Shultz wheeled on Jay Keyworth for encouraging the president on his utopian vision.

"You're a lunatic," he bellowed at Keyworth.

[Smith cites interviews with Keyworth, McFarlane, DeLauer, and Perle as the basis for this account.]

In Print: Biotech, Test Ban, R&D and the Constitution

The following publications are obtainable as indicated—not from SGR.

Biotechnology and the Changing Role of Government (125 pp., $20), fourth in a series on biotechnology by the Organization for Economic Cooperation and Development, this report describes policies in 15 of the 24 OECD nations and summarizes the proceedings of the Canada-OECD Joint Workshop on National Policies and Priorities in Biotechnology, April 1987 in Toronto.

Previous publications in the series: ***Recombinant DNA Safety Considerations*** (1986, 70 pp., $12); ***Biotechnology and Patent Protection*** (1985, 134 pp., $16); ***Biotechnology: International Trends and Perspectives*** (1982, 84 pp., $11).

OECD publications are available at OECD offices and booksellers in many major cities throughout the world. In the US: OECD Publications and Information Center, Suite 700, 2000 L St. NW, Washington, DC 20036-4095; tel. 202/785-6323.

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From the Congressional Office of Technology Assessment (OTA):

Seismic Verification of Nuclear Testing Treaties (GPO Stock No. 052-003-01108-5; 139 pp., $7), presents its message in the opening sentence: "Seismology now provides a means to monitor underground nuclear explosions down to low yields, even when strenuous attempts are made to evade the monitoring system." The report was prepared by a politically safe 19-member panel chaired by Howard Wesley Johnson, Honorary Chairman of the MIT Corporation. Members included William Colby, former CIA Director; Thomas A. Weaver, Deputy Director, Geophysical Group, Los Alamos National Laboratory, and Walter Alvarez, Professor of Geology and Geophysics, UC Berkeley. Coming from this group, under the imprint of the ideologically aloof OTA, the report provides a club against the diehard right's efforts to thwart enlargement of the underground test ban.

Criminal Justice: New Technologies and the Constitution (GPO Stock No. 052-003-01105-1; 54 pp., $2.75), third in a series of OTA papers, requested by the House Judiciary Committee, on the effects of scientific and technological advances on constitutional principles. Topics covered include new surveillance and identification technologies employed by police, computerized recordkeeping and data matching, "less-than-lethal" weapons, and electronic monitoring of parolees.

Previous publications in the series: ***Science, Technology and the First Amendment*** (GPO Stock No. 052-003-01090-9, $3.50); ***Science, Technology and the Constitution*** (GPO Stock No. 052-003-01086-1, $1.50).

Grassroots Development: The Africa Development Foundation (GPO Stock No. 052-003-01109-3; 181 pp., $8.50), reports on the ADF, a little-heard-of federal agency established by Congressional initiative in 1980 to assist economic development at the local level in Africa. The Foundation, funded at $7 million this year, has survived numerous throttling attempts by the Reagan Administration. OTA says the foundation's programs appear to be producing good results, but it's too early for a comprehensive evaluation.

OTA publications are available from: Superintendent of Documents, USGPO, Washington, DC 20402; tel. 202/783-3238.

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